ROLL NO. _____

Code: DC54 **Subject: DATA STRUCTURES**

DipIETE – CS

Time: 3 Hours **DECEMBER-2014** **Max. Marks: 100**

PLEASE WRITE YOUR ROLL NO. AT THE SPACE PROVIDED ON EACH PAGE IMMEDIATELY AFTER RECEIVING THE QUESTION PAPER.

NOTE: There are 9 Questions in all.

- **Question 1 is compulsory and carries 20 marks. Answer to Q.1 must be written in the space provided for it in the answer book supplied and nowhere else.**
- **The answer sheet for the Q.1 will be collected by the invigilator after 45 minutes of the commencement of the examination.**
- **Out of the remaining EIGHT Questions answer any FIVE Questions. Each question carries 16 marks.**
- **Any required data not explicitly given, may be suitably assumed and stated.**

Q.1 Choose the correct or the best alternative in the following: **(2×10)**

a. How is variable accessed from another file?

(A) global variable is referenced via the extern specifier
(B) global variable is referenced via the auto specifier
(C) global variable is referenced via the global specifier
(D) global variable is referenced via the pointer specifier

b. If the size of the array is less than the number of initializers then:

(A) Extra values are being ignored
(B) generates an error message
(C) size of array is increased
(D) size is neglected when values are given

c. All the members use the same memory location in:

(A) structures
(B) functions
(C) unions
(D) classes

d. What would be the output of the following?

```
#include<stdio.h>
main() { int a; *&a=50; printf("%d",a);}
```

(A) 20 **(B)** 30
(C) 40 **(D)** 50

e. Global variables have _____ lifetimes.

(A) Static **(B)** Automatic
(C) Both **(A)** & **(B)** **(D)** None of these

f. ASCII code of 'A' and 'a' are:-

(A) 65 and 97 **(B)** 90 and 122
(C) 68 and 102 **(D)** 26 and 52

g. Which statement will assign the jth element of array list to it's ith element

(A) list[j] = list[i]; **(B)** list[i]=list[j];
(C) j=i; **(D)** i=j;

h. For what purpose 'typedef' statement used?

(A) To define user defined data types
(B) To define data types
(C) To define enumerated data types
(D) To define constants

i. Dynamic Memory allocation is done _____

(A) at compile time **(B)** at link time
(C) at run time **(D)** never

j. The program execution in a C program starts from

(A) the function which is first defined
(B) the function which is last defined
(C) main( ) function
(D) None of these

Answer any FIVE Questions out of EIGHT Questions.
Each question carries 16 marks.

Q.2 a. Write a function that computes x^y using Recursion. **(8)**

b. Describe local scope of variables using a suitable example. **(5)**

c. When is register allocation done? **(3)**

Q.3 a. How are the Structures defined and initialized? Briefly explain it with an appropriate example. **(8)**

b. Write a program to initialize a structure of a student having rollno, gender, height, weight and display the contents using structure pointer. **(8)**

Q.4 a. Define an Array. Write a program which reads a list of ten numbers and prints the list in reverse order. **(8)**

b. (i) Can an array be assigned to another of same size and type? For example if two arrays A[5] and B[5] are available of the same type, what would be the effect of following statement? A=B **(3)**

(ii) Write a program to merge two sorted arrays in third one. **(5)**

Q.5 a. Discuss in detail the various methods of Stack Implementation. **(8)**

b. Explain how insertions and deletions are performed on Circular Queues using Arrays? What assumptions are made for this implementation? **(8)**

Q.6 a. Write a function to insert a node with data value n in a sorted linked list pointed to by p*. **(10)**

b. Explain how a singly linked list can be used for representing a polynomial. **(6)**

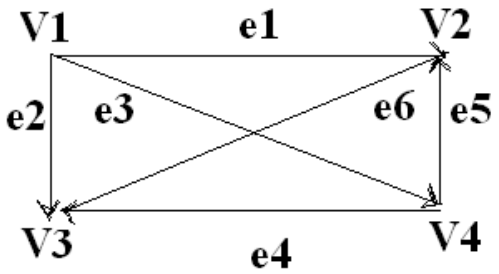
Q.7 a. By explaining the concept of deletion of a node from a double linked list, write an algorithm to delete a node from a doubly linked list. **(8)**

b. Write a program for building and printing the elements of a circular linked list. **(8)**

Q.8 a. Explain the formation of Binary Search Tree, by taking any suitable example. **(8)**

b. Explain the formation of a binary tree from its given preorder and postorder traversal using suitable example. **(8)**

Q.9 a. Describe Adjacency Matrix and develop the same for the following Directed Graph. **(8)**



b. Explain the difference between Spanning Tree (ST) and Minimum Spanning Tree (MST), using an example graph and its corresponding ST & MST. **(8)**